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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,364	03/31/2004	Edward K. Y. Jung	SE1-0015-US	1688

80118 7590 07/12/2010

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ART UNIT	PAPER NUMBER
2442	

MAIL DATE	DELIVERY MODE
07/12/2010	PAPER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/816,364
Filing Date: March 31, 2004
Appellant(s): JUNG ET AL.

Steven C. Stewart
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 23, 2010 appealing from the Office action mailed April 2, 2009.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

claims 1-180 are pending, have been twice rejected, and are subject of this appeal.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

NEW GROUNDS OF REJECTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 108-128 and 154-178 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claims 108 and 154, the structure disclosed in the written description of the specification is the corresponding structure only if the written description of the specification or the prosecution history **clearly links or associates** that structure to the function recited in a means-plus-function claim limitation under 35 U.S.C. 112, sixth paragraph. The requirement that a particular structure be clearly linked with the claimed function in order to qualify as corresponding structure is the *quid pro quo* for the convenience of employing 35 U.S.C. 112, sixth paragraph, and is also supported by the

requirement of 35 U.S.C. 112, second paragraph, that an invention must be particularly pointed out and distinctly claimed. For a means plus function claim limitation that invokes 35 U.S.C. 112, sixth paragraph, a rejection under 35 U.S.C. 112, second paragraph, is appropriate if one of ordinary skill in the art cannot identify what structure, material, or acts disclosed in the written description of the specification perform the claimed function.

In the instant case, claim elements “means for creating”, “means for aggregating", and “means for obtaining” are a means plus function limitations that invoke 35 U.S.C. 112, sixth paragraph. However, the written description fails to clearly link or associate the disclosed structure, material, or acts to the claimed function such that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function. In addition, appellants failed to state on the record in the summary of claims 108 and 154 (see Brief at pages 15-16 and 17-18) where the corresponding structure is set forth in the written description of the specification that perform the claimed function.

Applicant is required to:

(a) Amend the claims so that the claim limitation swill no longer be a means plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it clearly links or associates the corresponding structure, material, or acts to the claimed function without introducing any new matter (35 U.S.C. 132(a)); or

(c) State on the record where the corresponding structure, material, or acts are set forth in the written description of the specification that perform the claimed function such that there is a separate structure for each means recitation. For more information, see 37 CFR 1.75(d) and MPEP 2181 and 608.01(o).

It is noted that a bare statement that known techniques or methods can be used would not be a sufficient disclosure. *See In re Donaldson Co.*, 16 F.3d 1189, 1195, 29 USPQ2d 1845, 1850 (Fed. Cir. 1994) (in banc); and *Biomedino, LLC v. Waters Technology Corp.*, 490 F.3d 946, 952, 83 USPQ2d 1118, 1123 (Fed. Cir. 2007).

A rejection under 35 U.S.C. 112, second paragraph, is appropriate if the written description of the specification discloses no corresponding algorithm. *See Aristocrat,* 521 F.3d at 1337-38, 86 USPQ2d at 1243. For example, merely referencing to a general purpose computer with appropriate programming without providing any detailed explanation of the appropriate programming *See Id.* at 1334, 86 USPQ2d at 1240, or simply reciting software without providing some detail about the means to accomplish the function *See Finisar*, 523 F.3d at 1340-41, 86 USPQ2d at 1623, would not be an adequate disclosure of the corresponding structure to satisfy the requirements of 35 U.S.C. 112, second paragraph, even when one of ordinary skill in the art is capable of writing the software to convert a general purpose computer to a special purpose computer to perform the claimed function.

To this extent, reference to a general purpose “electric circuitry” as made at pages 41-42 of the specification that mentions how *"those skilled in the art will recognize that the various aspects described herein which can be implemented,*

individually and/or collectively, by a wide range of hardware, software, firmware, or any combination thereof can be viewed as being composed of various types of "electrical circuitry"" fails to reasonably convey to one of ordinary skill in the art that the inventors, at the time the application was filed, had an adequate disclosure of the corresponding structure as containing electrical circuitry required to satisfy the requirements of 35 USC 112, second paragraph, even if one of ordinary skill in the art is capable of producing the special purpose electrical circuitry from the general purpose electrical circuitry to perform the claimed function.

Dependent claims 109-128 further define one of the means recitations of independent claim 108. The disclosure is silent with respect to internal structure of any of the means of claim 108 as including additional means. Analogously, dependent claims 155-178 further define one of the means recitations of independent claim 154. The disclosure is silent with respect to internal structure of any of the means of claim 154 as including additional means.

Applicant is required to:

(a) Amend the claims so that the claim limitations will no longer be a means (or step) plus function limitation under 35 U.S.C. 112, sixth paragraph; or

(b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the claimed function of claims 14-26 without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so

that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant is required to clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner:

rejection of claims 108-128 and 154-178 under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant’s brief.

(8) Evidence Relied Upon

US 2002/0161751 A1	Mulgund et al.	01-17-2002
US 5,615,367	Bennett et al.	05-25-1993
US 7,165,109 B2	Chiloyan et al.	01-12-2001
US 2005/0021724 A1	Kung et al.	07-07-2003
US 6,421,354 B1	Godlewski	08-18-1999
US 2005/0141706 A1	Regli et al.	12-31-2003
US 2004/0122849 A1	Nelson	12-24-2002

Madden, S., et al. "The Design of an Acquisitional Query Processor For Sensor Networks", SIGMOD 2003, June 9-12, 12 pages

Madden, S., et al. "TAG: a Tiny AGgregation Service for Ad-Hoc Sensor Networks", draft for publication, copyright 2002, 14 pages

(9) Grounds of Rejection

The following grounds of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2-5, 8, 9, 11, 12, 14, 16, 19-21, 23, 25, 31-39, 42-46, 48, 50-53, 56, 57, 59, 60, 62, 64, 67-69, 71, 73, 79-87, 90-94, 96, 98-101, 104, 105, 108-112, 114-117, 119-122, 125, 126, 129-131, 133, 135, 137, 138, 140, 142, 144-147, 150, 151, 154-156, 158, 160, 162, 163, 165, 167, 169-172, 175, and 176 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. (US 2002/0161751 A1) in view of Bennett et al. (U.S. Patent No.: 5,615,367) and in further view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al.

As to claim 1, Mulgund teaches:

creating a plurality of first-administered content indexes for a first set of motes [building a database model by updating relational database logical design tables, the model created comprised of an identity of each of the sensing nodes as well as any metadata about each node of the set of nodes 2 at the left side of Fig. 1] (par. [0007], [0021]);

aggregating the plurality of first-administered content indexes of the first set of motes into an aggregated content index [retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]), wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)] (abstract, par. [0005], [0025]);

creating one or more second-administered content indexes for a second set of motes [building a database model by updating relational database logical design tables, the model created comprised of an identity of each of the sensing nodes as well as any

metadata about each node of the set of nodes 2 at the right side of Fig. 1] (par. [0007], [0021]);

obtaining at least a part of the one or more second-administered content indexes of the second set of motes [retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]), wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)].

Mulgund also inherently teaches having a federated index from the aggregated content index and at least a part of the one or more second-administered content indexes [joint table containing metadata and identity of each sensing node] (abstract, par. [0005] and [0025], Fig. 3, Fig. 4) [Data Table List (30) that provides mapping between individual nodes and the names of the tables used to store those nodes' sensor data] (par. [0042], Fig. 4).

Mulgund does not expressly teach "federated index".

Bennett expressly teaches creating a federated index from the aggregated content index and at least a part of the one or more second-administered content indexes [creating a design document from a first and second tables, each table containing an index] (summary of the invention, Fig. 5A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by expressly creating a federated index from the aggregated content index and at least a part of the one or more second-

administered content indexes, as taught by Bennett, in order to federate information from first and second indexes [tables containing metadata] into a relational database (abstract, in Bennett).

Mulgund in view of Bennett does not teach that the aggregated index is aggregated using (by) a gateway mote included within the first set of motes.

Madden teaches:

aggregating the plurality of first-administered content indexes of the first set of motes into an aggregated content index using a gateway mote included within the first-administered set of motes [the mote at the root of the routing tree (the mote that interacts directly with the base station] (Fig. 1; section 3.1 par. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having the aggregated index being aggregated using (by) a gateway mote included within the first set of motes in order to lower the number of message transmissions, latency, and power consumption than the server-based approach of Mulgund ("TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al., section 4 under In-Network Aggregates).

As to claim 2, Mulgund shows:

aggregating at least a part of one or more mote-addressed content indexes from a first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the

terms “node” and “mote” are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 3, Mulgund shows:

receiving at least a part of one or more mote-addressed indexes of the first set of motes [retrieving the information stored at the node] (par. 0062]).

As to claim 4, Mulgund shows:

creating one or more multi-mote content indexes of the first set of motes (Fig. 4, par. [0042]).

As to claim 5, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (pars [0035] and [0037]).

As to claim 8, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (pars [0035] and [0037]) from one or more motes to be included in the listing (par [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 9, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (par [0062]) wherein information is retrieved from a knowledge base (18) at a node (par [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 11, Mulgund shows:

receiving at least a part of one or more multi-mote content indexes of the first set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 12, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 14, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is

retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 16, Mulgund shows:

creating an aggregate of at least a part of one or more multi-mote content indexes of the first set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

As to claim 19, Mulgund shows:

migrating to a mote of the first set of motes [visiting a first sensor node] (paragraph [0007] lines18-19, paragraph [0062]); and

receiving at least a part of one or more mote-addressed content indexes with the multi-mote index creation agent [interrogating a node with a network modeling agent retrieving the information stored at the node (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base. However, the management module per se is not explicitly shown.

Madden shows installing a multi-mote index creation agent at the mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing a multi-mote index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 20, Mulgund shows:

receiving at least a part of one or more mote-addressed content indexes of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraphs [0025] and [0062]), wherein the terms “node” and “mote” are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 21, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 23, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is

retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 25, Mulgund shows:

determining at least one of a sensing function or a control function at a mote [discovering and maintaining the distributed sensor network topology (paragraph [0007]) wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

creating one or more mote-addressed content indexes in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (paragraph 0007)].

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

Additionally to Mulgund, Madden et al. shows:

determining at least one of a sensing function or a control function at a mote [sampling a sensor *s* to evaluate any predicate over the attribute *sensors.s* (section 4.2 Ordering of Sampling And Predicates)]; and

creating one or more mote-addressed content indexes in response to said determining [creating and maintaining a catalog of metadata that describes a particular mote’s local attributes, events, and information about the costs of processing and delivering data (section 4.1 Metadata Management, and Table 2, and 3)].

Madden also shows that recited functions are performed by a TinyDB (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by performing the steps of determining and creating in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 31, Mulgund in view of Bennett and in further view of Madden shows creating at least one extensible index [a sensors table, which is conceptually unbounded (section 3.1 paragraph 3) in Madden].

As to claim 32, Mulgund in view of Bennett and in further view of Madden shows creating the at least one extensible index in response to a type of content indexed [creating a sensors table in response to light and temperature readings selected as a type of content requested from sensors (section 3.1 paragraph 3 in Madden)].

As to claim 33, Mulgund in view of Bennett and in further view of Madden shows creating at least one a mote-addressed sensing index [a sensor table of sensors' readings (section 3.1 paragraph 3 in Madden)].

As to claim 34, Mulgund in view of Bennett and in further view of Madden shows creating at least one of a mote-addressed routing/spatial index [a list of neighbors and

some routing information about the connectivity of those neighbors to the rest of the network (section 2.2 Communication in Sensor Networks, paragraph 2 in Madden)].

As to claim 35, Mulgund in view of Bennett and in further view of Madden shows inserting at least one device identifier in the one or more mote-addressed content indexes [nodeid that is selected to be reported in the sensors table (section 3.1 in Madden, see the first query)].

As to claim 36, Mulgund in view of Bennett and Madden shows:

establishing an index-creating agent at a first gateway mote of the first set of motes [running a TinyDB, which is a distributed query processor that is installed on each of the motes in a sensor network] (section 1 Introduction, par. 4 in Madden);

determining a mote-network address of the mote (paragraphs [0021] and [0028] – [0031] in Mulgund); and

associating at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index with the mote-network address of the mote (Fig. 3 and paragraph [0037] in Mulgund).

As to claim 37, Mulgund shows:

migrating to a first gateway mote of the first set of motes [visiting a first sensor node] (paragraph [0007] lines18-19); and

querying at least one device entity with the index creation agent [interrogating a node with a network modeling agent] (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base, however, the management module per se is not explicitly shown.

Madden shows installing an index creation agent at the first gateway mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing an index creation agent at the first gateway mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 38, Mulgund shows:

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of control available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of control available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 39, Mulgund shows:

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of sensing available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of sensing available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claims 42-44, the claimed limitations are interpreted broadly since the meaning of the recited limitations is not understood.

As to claims 42-44, Mulgund shows associating one or more mote-appropriate routing addresses [note addresses (see table 20 of Fig. 3)] with at least one mote-addressed content index (Fig. 3 and Fig. 4, paragraphs [0037]-[0038]) wherein mote-addressed content index could be addressed directly or indirectly depending on the implementation (paragraph [0042]).

Claims 45, 46, 93, and 94 will be examined as best understood.

As to claim 45 (and claim 93 by extension), and claim 46 (and claim 94 by extension), Mulgund shows selecting from one or more predetermined protocols and publishing at least a part of an identifier of the selected predetermined protocol [selecting and identifying selected protocol such as the Internet] (abstract).

As to claim 48, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 50, Mulgund shows:

aggregating at least a part of one or more mote-addressed content indexes from a second set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4), wherein the terms “node” and “mote” are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 51, Mulgund shows:

receiving at least a part of one or more mote-addressed indexes of the second set of motes [retrieving the information stored at the node] (par [0062]).

As to claim 52, Mulgund shows:

creating one or more multi-mote content indexes of the second set of motes (Fig. 4, paragraph [0042]).

As to claim 53, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

As to claim 56, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from one or more motes to be included in the listing (paragraph [0061] and [0062]) wherein the second column in table 1 (CAL) shows the current links from the Node being visited.

As to claim 57, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 59, Mulgund shows:

receiving at least a part of one or more multi-mote content indexes of the second set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 60, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 62, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 64, Mulgund shows:

creating an aggregate of at least a part of one or more multi-mote content indexes of the second set of motes (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

As to claim 67, Mulgund shows:

migrating to a mote of the second set of motes [visiting a first sensor node] (paragraph [0007] lines 18-19, paragraph [0062]); and

receiving at least a part of one or more mote-addressed content indexes with the multi-mote index creation agent [interrogating a node with a network modeling agent retrieving the information stored at the node (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base. However, the management module per se is not explicitly shown.

Madden shows installing a multi-mote index creation agent at the mote comprising a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing a multi-mote index creation agent at the mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 68, Mulgund shows:

receiving at least a part of one or more mote-addressed content indexes of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraphs [0025] and [0062]), wherein the terms “node” and “mote” are interpreted to have the same meaning of small embedded platform that has one or more sensors (paragraph [0026]) and therefore these terms are used here interchangeably.

As to claim 69, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 71, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 73, Mulgund shows:

determining at least one of a sensing function or a control function at a mote [discovering and maintaining the distributed sensor network topology (paragraph [0007])

wherein at least one of a sensing function or a control function is interpreted to be at least one of the data elements outlined in paragraphs 0021 – 0024]; and

creating one or more mote-addressed content indexes in response to said determining [building a database model by updating relational database logical design tables at each step of the discovering step (paragraph 0007)].

Mulgund also shows a sensor network modeling agent (summary of the invention) for performing the recited functions.

Additionally to Mulgund, Madden et al. shows:

determining at least one of a sensing function or a control function at a mote [sampling a sensor *s* to evaluate any predicate over the attribute *sensors.s* (section 4.2 Ordering of Sampling And Predicates)]; and

creating one or more mote-addressed content indexes in response to said determining [creating and maintaining a catalog of metadata that describes a particular mote's local attributes, events, and information about the costs of processing and delivering data (section 4.1 Metadata Management, and Table 2, and 3)].

Madden also shows that recited functions are performed by a TinyDB (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by performing the steps of determining and creating in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 79, Mulgund in view of Bennett and in further view of Madden shows creating at least one extensible index [a sensors table, which is conceptually unbounded (section 3.1 paragraph 3) in Madden].

As to claim 80, Mulgund in view of Bennett and in further view of Madden shows creating the at least one extensible index in response to a type of content indexed [creating a sensors table in response to light and temperature readings selected as a type of content requested from sensors (section 3.1 paragraph 3 in Madden)].

As to claim 81, Mulgund in view of Bennett and in further view of Madden shows creating at least one a mote-addressed sensing index [a sensor table of sensors' readings (section 3.1 paragraph 3 in Madden)].

As to claim 82, Mulgund in view of Bennett and in further view of Madden shows creating at least one of a mote-addressed routing/spatial index [a list of neighbors and some routing information about the connectivity of those neighbors to the rest of the network (section 2.2 Communication in Sensor Networks, paragraph 2 in Madden)].

As to claim 83, Mulgund in view of Bennett and in further view of Madden shows inserting at least one device identifier in the one or more mote-addressed content indexes [nodeid that is selected to be reported in the sensors table (section 3.1 in Madden, see the first query)].

As to claim 84, Mulgund in view of Bennett and Madden shows:

establishing an index-creating agent at a second gateway mote of the second set of motes [running a TinyDB, which is a distributed query processor that is installed on each of the motes in a sensor network] (section 1 Introduction, par. 4 in Madden);

determining a mote-network address of the mote (paragraphs [0021] and [0028] – [0031] in Mulgund); and

associating at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index with the mote-network address of the mote (Fig. 3 and paragraph [0037] in Mulgund).

As to claim 85, Mulgund shows:

migrating to a second gateway mote of the second set of motes [visiting a first sensor node] (paragraph [0007] lines18-19); and

querying at least one device entity with the index creation agent [interrogating a node with a network modeling agent] (paragraph [0044]).

Mulgund shows that each node contains some local memory or other knowledge base for recording sensor output data, which can be retrieved by interrogating the node (paragraph [0030]), which suggests that there exists some management module that collects data from sensors and stores it in the knowledge base, however, the management module per se is not explicitly shown.

Madden shows installing an index creation agent at the second gateway mote [a TinyDB, which is a distributed query processor that runs on each of the nodes in a sensor network] (section 1 Introduction, paragraph 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by installing an index creation agent at the second gateway mote in order to select, join, project, and aggregate data from the sensors (section 1 Introduction, paragraph 4 in Madden).

As to claim 86, Mulgund shows:

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of control available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of control available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claim 87, Mulgund shows:

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]);

determining one or more types of sensing available from one or more devices of the mote (paragraphs [0021] – [0024]) wherein the following data elements are obtained by interrogating a node (paragraph [0044]); and

associating the one or more types of sensing available from one or more devices of the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

As to claims 90-92, the claimed limitations are interpreted broadly since the meaning of the recited limitations is not understood.

As to claims 90-92, Mulgund shows associating one or more mote-appropriate routing addresses [note addresses (see table 20 of Fig. 3)] with at least one mote-addressed content index (Fig. 3 and Fig. 4, paragraphs [0037]-[0038]) wherein mote-addressed content index could be addressed directly or indirectly depending on the implementation (paragraph [0042]).

As to claim 96, Mulgund shows:

receiving at least a part of at least one of a mote-addressed sensing index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at a node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

As to claim 98, Mulgund shows creating the federated index from at least a part of one or more multi-mote content indexes of the first set of motes (Fig. 4, par. [0042]).

As to claim 99, Mulgund shows creating the federated index from at least a part of at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index of the first set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claim 100, Mulgund shows creating the federated index from at least a part of one or more multi-mote content indexes of the second set of motes (Fig. 4, par. [0042]).

As to claim 101, Mulgund shows creating the federated index from at least a part of at least one of a mote-addressed sensing index, a mote-addressed control index, or a mote-addressed routing/spatial index of the second set of motes [visiting a node and retrieving the information stored at the node) (paragraphs [0007], [0026] lines 11-17, and [0062]).

As to claims 104 and 150, Mulgund shows generating the federated index to have information pertaining to a currency of at least one entry of an administered content index [timestamp status] (Figs. 3 and 4).

As to claims 105 and 151, Mulgund shows generating the federated index to have information pertaining to an expiration of at least one entry of an administered content index [timestamp status] (Figs. 3 and 4, par. [0041]).

As to claim 108, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 1.

As to claim 109, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 2.

As to claim 110, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 3.

As to claims 111 and 116, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 25.

As to claim 112, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 9.

As to claim 114, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 50.

As to claim 115, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 51.

As to claim 117, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 57.

As to claim 119, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 98.

As to claim 120, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 99.

As to claim 121, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 100.

As to claim 122, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 101.

As to claim 125, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 104.

As to claim 126, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 105.

As to claim 129, Mulgund teaches:

aggregating a plurality of first-administered content indexes from a first set of motes [the set of nodes 2 at the left side of Fig. 1] into an aggregated content index [retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]), wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)] (abstract, par. [0005], [0025]);

obtaining at least a part of a second-administered content index of a second set of motes [the set of nodes 2 at the right side of Fig. 1; retrieving the information stored at the node, the information including an identity of each of the sensing nodes as well as any metadata about each node (par. [0062]) wherein information is retrieved from a knowledge base (18) at a node (par. [0026] lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4)].

Mulgund inherently teaches having a federated index from the aggregated content index and at least a part of the second-administered content index [joint table

containing metadata and identity of each sensing node] (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4) [Data Table List (30) that provides mapping between individual nodes and the names of the tables used to store those nodes' sensor data] (par. [0042], Fig. 4).

Mulgund does not expressly teach "federated index".

Bennett expressly teaches creating a federated index from the aggregated content index and at least a part of the second-administered content index [creating a design document from a first and second tables, each table containing an index] (summary of the invention, Fig. 5A).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund by expressly creating a federated index from the aggregated content index and at least a part of the second-administered content index, as taught by Bennett, in order to federate information from first and second indexes [tables containing metadata] into a relational database (abstract, in Bennett).

Mulgund in view of Bennett does not teach that the aggregated index is aggregated using (by) an aggregating mote from among the first set of motes.

Madden teaches:

aggregating a plurality of first-administered content indexes from a first set of motes into an aggregated content index using an aggregating mote from among the first set of motes [the mote at the root of the routing tree (the mote that interacts directly with the base station] (Fig. 1; section 3.1 par. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett by having the aggregated index being aggregated using (by) an aggregating mote from among the first set of motes in order to lower the number of message transmissions, latency, and power consumption than the server-based approach of Mulgund ("TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks" by Samuel Madden et al., section 4 under In-Network Aggregates).

As to claim 130, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 3.

As to claim 131, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 12.

As to claim 133, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 14.

As to claim 135, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 9.

As to claim 137, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 51.

As to claim 138, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 60.

As to claim 140, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 62.

As to claim 142, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 57.

As to claim 144, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 98.

As to claim 145, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 99.

As to claim 146, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 100.

As to claim 147, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 101.

As to claim 154, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 129.

As to claim 155, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 130.

As to claim 156, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 131.

As to claim 158, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 133.

As to claim 160, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 135.

As to claim 162, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 137.

As to claim 163, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 138.

As to claim 165, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 140.

As to claim 167, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 142.

As to claim 169, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 144.

As to claim 170, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 145.

As to claim 171, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 146.

As to claim 172, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 147.

As to claim 175, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 150.

As to claim 176, Mulgund in view of Bennett and in further view of Madden shows all the elements, as discussed above with respect to claim 151.

Claims 6, 7, 54, and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claims 6 and 54, Mulgund shows:

obtaining a listing of motes appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]) from a multi-mote registry [Nodes Table (20)].

Chiloyan also shows:

obtaining a listing of devices from a registry [having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry] (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by obtaining a list of devices from a registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

As to claims 7 and 55, Mulgund shows:

obtaining a pre-loaded listing of motes [initial model construction listing] (paragraph [0046]) appropriate to at least one of the one or more multi-mote content indexes (paragraphs [0035] and [0037]).

Chiloyan also shows:

obtaining a pre-loaded listing of devices [devices already included in the current device registry] (col. 1 lines 50-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by obtaining a pre-loaded list of devices in order to check if the particular device model and necessary information about the device is already included in the registry (col. 1 lines 58-63 in Chiloyan).

Claims 10, 13, 15, 17, 18, 22, 24, 40, 41, 49, 58, 61, 63, 65, 66, 70, 72, 88, 89, 97, 113, 118, 132, 134, 136, 139, 141, 143, 157, 159, 161, 164, 166, and 168 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Kung et al. (US 2005/0021724 A1).

As to claim 10, Mulgund teaches:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (par 0062]), wherein information is retrieved from a

knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not teach that received index is a mote-addressed routing/spatial index.

Kung teaches determining one or more types of spatial information related to devices of or proximate to the mote (par. [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (par [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (par [0026] lines 11-17 in Mulgund).

As to claim 13, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 15, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claims 17 and 18, Mulgund shows:

aggregating at least a part of a mote-addressed index of a multi-mote content index (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Mulgund does not show that a mote-addressed index is a routing/spatial index.

Madden shows a mote-addressed routing/spatial index at a mote (under 2.2 communication in sensor networks, paragraph 2).

Kung also shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index being aggregated in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes

in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 22, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more first-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 24, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 40, Mulgund shows:

determining a mote-network address of a mote of the first set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information related to devices of or proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of spatial information related to devices of or proximate to the mote.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by determining one or more types of spatial information related to devices of or proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 41, Mulgund shows:

determining a mote-network address of the mote of the first set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information of other motes proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of absolute spatial information of other motes proximate to the mote.

Kung shows determining one or more types of absolute spatial information of other motes proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by determining one or more types of absolute spatial information of other motes proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 49, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the first set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in

communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 58, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 61, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 63, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving

the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claims 65 and 66, Mulgund shows:

aggregating at least a part of a mote-addressed index of a multi-mote content index (abstract, paragraph [0005] and [0025], Fig. 3, Fig. 4).

Mulgund does not show that a mote-addressed index is a routing/spatial index.

Madden shows a mote-addressed routing/spatial index at a mote (under 2.2 communication in sensor networks, paragraph 2).

Kung also shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index being aggregated in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 70, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from at least one aggregation of one or more second-administered indexes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of

Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 72, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a multi-mote reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph

[0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 88, Mulgund shows:

determining a mote-network address of a mote of the second set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information related to devices of or proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of spatial information related to devices of or proximate to the mote.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by determining one or more types of spatial information related to devices of or proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 89, Mulgund shows:

determining a mote-network address of the mote of the second set of motes (paragraphs [0021] and [0028] – [0031]); and

associating the one or more types of information of other motes proximate to the mote with the mote-network address of the mote (Fig. 3 and paragraph [0037]).

Mulgund does not show determining one or more types of absolute spatial information of other motes proximate to the mote.

Kung shows determining one or more types of absolute spatial information of other motes proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by determining one or more types of absolute spatial information of other motes proximate to the mote in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung).

As to claim 97, Mulgund shows:

receiving at least a part of at least one of a mote-addressed index from a reporting entity at a mote of the second set of motes [visiting a node and retrieving the information stored at the node] (paragraph 0062]) wherein information is retrieved from a knowledge base (18) at each node (paragraph [0026 lines 11-17) and used to form a relational database (Fig. 3 and Fig. 4).

Mulgund does not show that received index is a mote-addressed routing/spatial index.

Kung shows determining one or more types of spatial information related to devices of or proximate to the mote (paragraph [0036]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by having a mote-addressed routing/spatial index that is stored at the reporting entity at a mote [knowledge base (18)] being received [obtained] in order to determine a global position of a mote that would identify a location of the mote in space (paragraph [0010] in Kung) and relative to other nodes since each of the sensing nodes in communication with one or more other sensing nodes (paragraph [0026] lines 11-17 in Mulgund).

As to claim 113, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 10.

As to claim 118, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 58.

As to claim 132, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 13.

As to claim 134, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 15.

As to claim 136, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 10.

As to claim 139, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 61.

As to claim 141, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 63.

As to claim 143, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 58.

As to claim 157, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 132.

As to claim 159, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 134.

As to claim 161, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 136.

As to claim 164, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 139.

As to claim 166, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 141.

As to claim 168, Mulgund in view of Bennett, Madden, and in further view of Kung shows all the elements, as discussed above with respect to claim 143.

Claims 26 and 74 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Chiloyan et al. (US Patent No.: 7,165,109).

As to claims 26 and 74, Mulgund in view of Bennett and in further view of Madden shows all the elements except for accessing at least one device entity registry.

Chiloyan shows accessing at least one device entity registry comprising having an operational system accessing device registry to check if the particular peripheral device model is included in the current device registry (col. 1 lines 50-65).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by accessing at least one device entity registry in order to check if the particular device model and necessary information about the device is in the registry (col. 1 lines 58-63 in Chiloyan).

Claims 27-30 and 75-78 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Godlewski (US Patent No.: 6,421,354).

As to claims 27 and 75, Madden shows communicating with at least one device comprising a sensor to collect its reading data (section 3.1 Basic Language Features) and store it in a sensors table (lines 1-20).

Mulgund in view of Bennett and in further view of Madden does not expressly shows that communication is established with at least one device-associated entity.

Godlewski shows communicating with at least one device-associated entity comprising a sensor interface (Fig. 1 and Fig. 4) (col. 1 lines 45-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by communicating with at least one device-associated entity in order to receive data from a sensor in the appropriate format (col. 1 lines 45-55 in Godlewski).

As to claims 28 and 76, Mulgund in view of Bennett, Madden and in further view of Godlewski shows communicating with at least a light device entity (col. 5 lines 58-67 and col. 6 lines 1-10 in Godlewski).

As to claims 29 and 77, Mulgund in view of Bennett and in further view of Madden shows accessing at least one device identifier of a mote-addressed content index (section 3.1 Basic Language Features lines 14-16 in Madden).

As to claims 30 and 78, Mulgund in view of Bennett, Madden and in further view of Godlewski shows communicating with at least one device entity using a common application protocol (Fig. 6 col. 13 lines 7-42 in Godlewski).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and Madden by communicating with at least one device entity using a common application protocol in order to transmit data from a sensor to the communicator using sensor interface software (col. 13 lines 35-42 in Godlewski).

Claims 47 and 95 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Regli et al. (US 2005/0141706 A1).

Claims 47 and 95 will be examined as best understood.

As to claim 47 (and claim 95 by extension), Mulgund in view of Bennett and in further view of Madden shows all the elements except for encryption utilizing at least one of a private or a public key.

Regli shows encryption utilizing at least one of a private or a public key (paragraph [0056]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by encryption utilizing at least one of a private or a public key in order to support encrypted communication at the network layer between wireless devices (paragraphs [0054]-[0056] in Regli).

Claims 102, 103, 106, 123, 124, 127, 148, 149, 152, 173, 174, and 177 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. and in further view of Nelson (US 2004/0122849 A1).

As to claim 102, Mulgund in view of Bennett and in further view of Madden shows all the elements except for generating the federated index to have one or more entries noting one or more respective administrative domains of one or more content index entries.

Nelson shows generating the federated index [database table] to have one or more entries noting one or more respective administrative domains of one or more content index entries (abstract, Figs. 3A-3C, par. [0017]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of

Madden by generating the federated index to have one or more entries noting one or more respective administrative domains of one or more content index entries in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 103, Mulgund in view of Bennett and in further view of Madden shows all the elements except for generating the federated index to have access information to one or more content indexes for an administered content index.

Nelson shows generating the federated index [database table] to have access information [domain ID] to one or more content indexes for an administered content index (abstract, Figs. 3A-3C and 7, par. [0017]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by generating the federated index to have access information to one or more content indexes for an administered content index in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 106, Mulgund in view of Bennett and in further view of Madden shows all the elements except for generating the federated index to have metadata pertaining to an administrative domain, wherein the metadata includes an ownership indicator.

Nelson shows generating the federated index [database table] to have metadata pertaining to an administrative domain, wherein the metadata includes an ownership indicator (par. [0040], Fig. 3C).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden by generating the federated index to have metadata pertaining to an administrative domain, wherein the metadata includes an ownership indicator in order to limit a user access to documents in the database only to the user's own domain (abstract in Nelson).

As to claim 123, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 124, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 127, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

As to claim 148, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 149, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 152, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

As to claim 173, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 102.

As to claim 174, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 103.

As to claim 177, Mulgund in view of Bennett, Madden, and in further view of Nelson shows all the elements, as discussed above with respect to claim 106.

Claims 107, 128, 153, and 178 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett in view of “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. (hereinafter *Madden ACQP*) and in further view of “TAG: a Tiny Aggregation Service for Ad-Hoc Sensor Networks” by Samuel Madden et al. (hereinafter *Madden TAG*).

As to claim 107, Mulgund in view of Bennett and in further view of Madden ACQP shows all the elements except for having an administrative domain-specific query string

generated for or supplied by an administrative domain to produce an updated content index for that domain.

Madden TAG shows having an administrative domain-specific query string generated for or supplied by an administrative domain to produce an updated content index for that domain (abstract, section 1.1 the TAG Approach).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Mulgund in view of Bennett and in further view of Madden ACQP by having an administrative domain-specific query string generated for or supplied by an administrative domain to produce an updated content index for that domain in order produce updated content index (Mulgund, par. [0041]).

As to claim 128, Mulgund in view of Bennett, Madden ACQP, and in further view of Madden TAG shows all the elements, as discussed above with respect to claim 107.

As to claim 153, Mulgund in view of Bennett, Madden ACQP, and in further view of Madden TAG shows all the elements, as discussed above with respect to claim 107.

As to claim 178, Mulgund in view of Bennett, Madden ACQP, and in further view of Madden TAG shows all the elements, as discussed above with respect to claim 107.

Claims 179 and 180 are rejected under 35 U.S.C. 103(a) as being unpatentable over “The Design of an Acquisitional Query Processor For Sensor Networks” by Samuel Madden et al. in view of Mulgund et al.

As to claim 179, Madden teaches:

at least one computational system having electrical circuitry and being operably coupled with a first-administered set of motes [a powered PC (the base station)] (Fig. 1);

at least one gateway mote included within at least one of the first-administered set of motes or the second-administered set of motes [the mote at the root of the routing tree (the mote that interacts directly with the base station] (Fig. 1), the at least one gateway mote including a multi-mote index creation agent [a TinyDB, which is a distributed query processor that runs on each of the motes in a sensor network (section 1 Introduction, par. 4) configured to:

receive a plurality of content indexes from a corresponding plurality of motes of the at least one of the first-administered set of motes or the second-administered set of motes (Fig. 1; section 3.1 par. 3-4), and

aggregate the plurality of content indexes into at least one aggregated index associated with the at least one of the first-administered set of motes or the second-administered set of motes, respectively (Fig. 1; section 3.1 par. 4).

Madden further teaches the computational system configured to receive the at least one aggregated index (Fig. 1).

However, Madden does not teach at least one federated index creation agent resident in the computational system, said at least one federated index creation agent

configured to receive the at least one aggregated index, and to create a federated index that includes the at least one aggregated index.

Mulgund teaches:

at least computational system having electrical circuitry [database server (10)] and being operably coupled with a first-administered set of motes [set of nodes 2 at the left side of Fig. 1] and a second-administered set of motes [set of nodes 2 at the right side of Fig. 1];

at least one gateway access point (6) (Fig. 1) included within at least one of the first-administered set of motes or the second-administered set of motes (Fig. 1); and

at least one federated index creation agent resident in the computational system [network modeling agent (14)] (Fig. 1), said at least one federated index creation agent configured to receive at least one index [retrieving the information stored at the node] (par. [0062]), and to create a federated index that includes the received index [Data Table List (30) that provides mapping between individual nodes and the names of the tables used to store those nodes' sensor data] (par. [0042], Fig. 4).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Madden by having at least one federated index creation agent resident in the computational system, said at least one federated index creation agent configured to receive the at least one aggregated index, and to create a federated index that includes the at least one aggregated index in order to aggregate the information at each of the nodes into an off-network repository or network model database (par. [0025] in Mulgund).

As to claim 180, Madden teaches:

at least one computational system having electrical circuitry and being operably coupled with a first-administered set of motes [a powered PC (the base station)] (Fig. 1);

at least one gateway mote included within at least one of the first-administered set of motes or the second-administered set of motes [the mote at the root of the routing tree (the mote that interacts directly with the base station] (Fig. 1), the at least one gateway mote including a multi-mote index creation agent [a TinyDB, which is a distributed query processor that runs on each of the motes in a sensor network (section 1 Introduction, par. 4) configured to:

receive a plurality of content indexes from a corresponding plurality of motes of the at least one of the first-administered set of motes or the second-administered set of motes (Fig. 1; section 3.1 par. 3-4), and

aggregate the plurality of content indexes into at least one aggregated index associated with the at least one of the first-administered set of motes or the second-administered set of motes, respectively (Fig. 1; section 3.1 par. 4).

Madden further teaches the computational system configured to receive the at least one aggregated index (Fig. 1).

However, Madden does not teach at least one federated index resident in the computational system, said at least one federated index configured to contain the at least one aggregated index.

Mulgund teaches:

at least computational system having electrical circuitry [database server (10)] and being operably coupled with a first-administered set of motes [set of nodes 2 at the left side of Fig. 1] and a second-administered set of motes [set of nodes 2 at the right side of Fig. 1];

at least one gateway access point (6) (Fig. 1) included within at least one of the first-administered set of motes or the second-administered set of motes (Fig. 1); and

at least one federated index [Data Table List (30) that provides mapping between individual nodes and the names of the tables used to store those nodes' sensor data] (par. [0042], Fig. 4) resident in the computational system, said at least one federated index configured to contain at least one received index (par. [0021] – [0024]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Madden by having at least one federated index resident in the computational system, said at least one federated index configured to contain the at least one aggregated index in order to aggregate the information at each of the nodes into an off-network repository or network model database (par. [0025] in Mulgund).

(10) Response to Argument

It is noted that appellant's arguments are generally addressed in the same order as the grounds of rejection made in the Final Office action. It is further noted that at pages 87-88 of the Brief under the heading "conclusion" appellants made several statements pertaining to allegedly canceled claims. However, examiner fails to identify

which claims appellants refer to since none of the claims have in fact been canceled. Appellants are therefore requested to review the status of the claims in the application and avoid, in their future responses, statements that do not reflect the status of the application or the claims.

Regarding the rejection of claims 108-128 and 154-178 under 112, first paragraph (now withdrawn, wherein new grounds of rejection of claims 108-128 and 154-178 under 112, second paragraph are made instead) appellants argue at pages 85-87 of the Brief that *"for the foregoing reasons, Applicant respectfully submits that claims 108 and 154 contain subject matter which was described in the specification….."* However, examiner notes that there are no "foregoing reasons", as alleged by appellant. Appellant's citation of several sections of the specification that summarizes the general state of the art and has little relevance to particular functionality and structure represented by means-plus-function language cannot be taken as "foregoing reasons" absent explanation of how cited sections of the specification reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

Regarding the rejection of claims 1-180 under 35 U.S.C. 103(a), appellant's arguments have been fully considered but they are not persuasive.

As to claim 1, appellants copy-and-pasted the whole claim (with some underlining), the whole reasons for rejection of claim 1 (several pages from the Final

Office action), and numerous paragraphs, sections, and figures of Mulgund, Madden, and Bennett, providing no rationale how and why they believe cited material does not teach claimed subject matter. It is noted that copy-pasting whole sections of applied references, reasons for rejection and whole claim does not aid in establishing appellant's position, understanding appellant's argument, and providing concise response.

At point 1) appellants argue at pages 31 and 36 of the Brief that *"Applicant has reviewed the portions of Mulgund identified by Examiner, and so far as Applicant can discern, Mulgund does not recite or suggest the text of clause [b] of Applicant's claim 1"*.

This argument is not persuasive for multiple reasons: at first, it is noted that appellants are required to review the whole reference and not only the sections identified by examiner as teaching specific elements of the claim. At second, in order to for examiner to establish a prima facie case of unpatentability of an applicants' claim, examiner must interpret the claim. If it could be shown that the cited prior art discloses the claimed limitations in exactly the same words, no claim interpretation would be necessary. Therefore, Office action is not required to identify a reference that would repeat claim language verbatim, that is "recite the text of claim 1" as that what appellants are expecting of the reference. At last, clause [b] was rejected over a combination of references, as discussed in the reasons for rejection. In particular, the feature of the aggregated index being aggregated using (by) a gateway mote included within the first set of motes was taught by Madden and not Mulgund. Appellants are

advised to carefully review the reasons for rejection presented in the last Office action and repeated in this Examiner's answer at section 9.

At point 2), appellants argue at pages 36-37 of the Brief that *"neither Mulgund, Bennett or Madden shows or suggest the text of clause [e] of applicant's claim 1"*. This argument is not persuasive for analogous reasons as those discussed at point 1 above. In particular, appellants attempt to compare text of clause [e] of claim 1 with cited sections of applied references providing no explanation how, in their opinion, subject matter of the claim and subject matter of the references is different. However, without appellant's insight on what claim is intended to mean and how it is different (in appellant's opinion) from cited references, examiner cannot better respond to what amounts to a general allegation of patentability over cited art. It is maintained that the examiner has met his burden to show claims 1-180 are unpatentable over the applied references since the examiner presented a prima facie case of unpatentability. In particular, the examiner interpreted the claims at issue (giving claims broadest reasonable interpretation in light of the specification), defined one or more prior art reference components relevant to the claim at issue (see reasons for rejection of claim 1), ascertained the differences between the one or more prior art reference components and the elements of the claim at issue (see reasons for rejection of claim 1), and adduced objective evidence which establishes, under a preponderance of the evidence standard, a teaching to modify the teachings of the prior art reference components such that the prior art reference components can be used to construct a device substantially equivalent to the claim at issue (see reasons for rejection of claim 1).

At point 3), appellants argue at page 37 of the Brief that *"Examiner-cited Mulgund, Bennett and Madden reference are very different on their faces"*. Examiner disagrees and notes that all references are either in the field of applicant's endeavor or, if not, then reasonably pertinent to the particular problem with which the applicant was concerned. Examiner further notes that no statue, rule or MPEP guideline require <u>direct quotations</u> of the cited references match word by word with the express claim language since applicant's claims are subject to interpretation. If applicants disagree and are aware of any such statue, rule, section of MPEP or Board decision that would require cited paragraphs/sections of a reference be identical on its face as the language of the claim, appellants are requested to notify the examiner in the Reply Brief.

As to claims 108, 129, 154, 179, and 180, appellants presented analogous arguments as those discussed per claim 1 that do not arise a need to be addressed separately.

Regarding the rejection of claims 10, 13, 15, 17, 18, 22, 24, 40, 41, 49, 58, 61, 63, 65, 66, 70, 72, 88, 89, 97, 113, 118, 132, 134, 136, 139, 141, 143, 157, 159, 161, 164, 166, and 168 under 35 U.S.C. 103(a) as being unpatentable over Mulgund et al. in view of Bennett et al. in view of "The Design of an Acquisitional Query Processor For Sensor Networks" by Samuel Madden et al. and in further view of Kung et al. (US 2005/0021724 A1), appellants argued at page 81 of the Brief that they are unable to locate the exact portions in the Kung's provisional application (relied on) which the

Office used in rejection of the aforementioned claims. Examiner notes that there is no requirement for the provisional application to contain exact portions/paragraphs as US 2005/0021724 A1 to Kung as long as provisional application supports the subject matter of corresponding non-provisional application.

In the instant case, Kung was relied on to teach the limitation of determining spatial information of sensor node, such as the latitude, longitude, altitude or x,y,z coordinates of the sensor node (par. [0036] of non-provisional application to Kung). In the same paragraph Kung discloses that this spatial information is determined by a GPS device means of the sensor node. The provisional application to Kung discloses a method of monitoring a controlled area governed by a plurality of sensing nodes and at least one user control node associated with a user, the method comprising receiving information from the sensing node (claim 1 at page 7), wherein the sensing node comprises GPS sensor. Since it is notoriously old and well known in the art that GPS sensor is a Global Positioning System device that communicates the latitude, longitude, altitude or x,y,z coordinates of the sensor node, it is maintained that Kung's provisional application fully supports the subject matter relied on in the non-provisional application in Kung.

As to any arguments not specifically addressed, they are the same as those discussed above.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejection of claims 108-128 and 154-178 under 35 U.S.C. 112, second paragraph and rejection of claims 1-180 under 35 U.S.C. 103(a) should be sustained.

This examiner's answer contains a new ground of rejection set forth in section **(6)** above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) **Maintain appeal.** Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be

treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

Oleg Survillo, Examiner, AU 2442

/O.S./

June 3, 2010

/Philip C Lee/

Acting SPE of Art Unit 2442

A Technology Center Director or designee must personally approve the new grounds of rejection set forth in section (6) above by signing below:

***

/Glenton B. Burgess/

Acting Director, TC 2400

Conferees:

/Philip C Lee/

Acting SPE of Art Unit 2442

/Jeffrey Pwu/

Supervisory Patent Examiner, Art Unit 2446